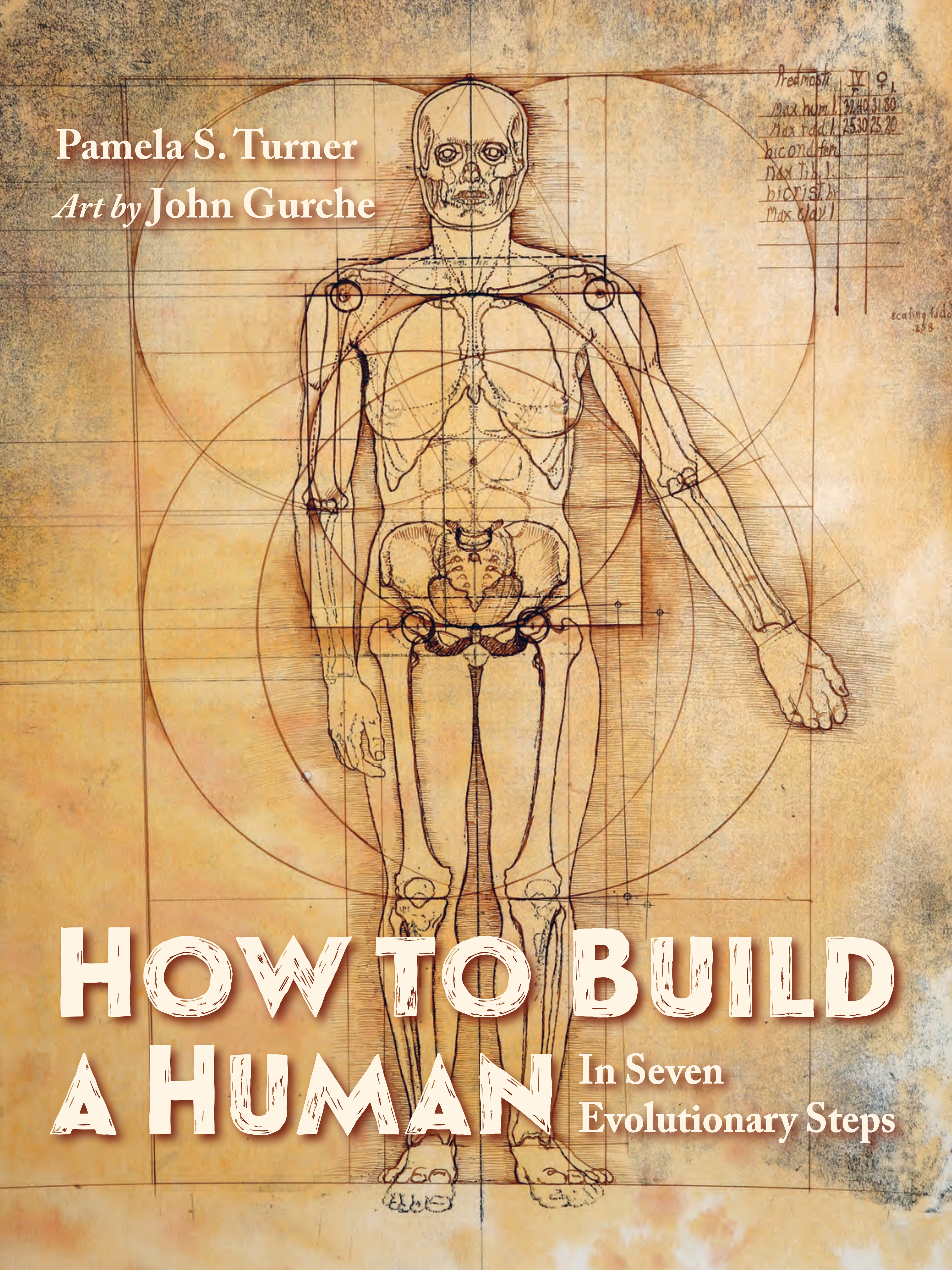

Pamela S. Turner

Art by John Gurche

How to Build a Human

In Seven Evolutionary Steps

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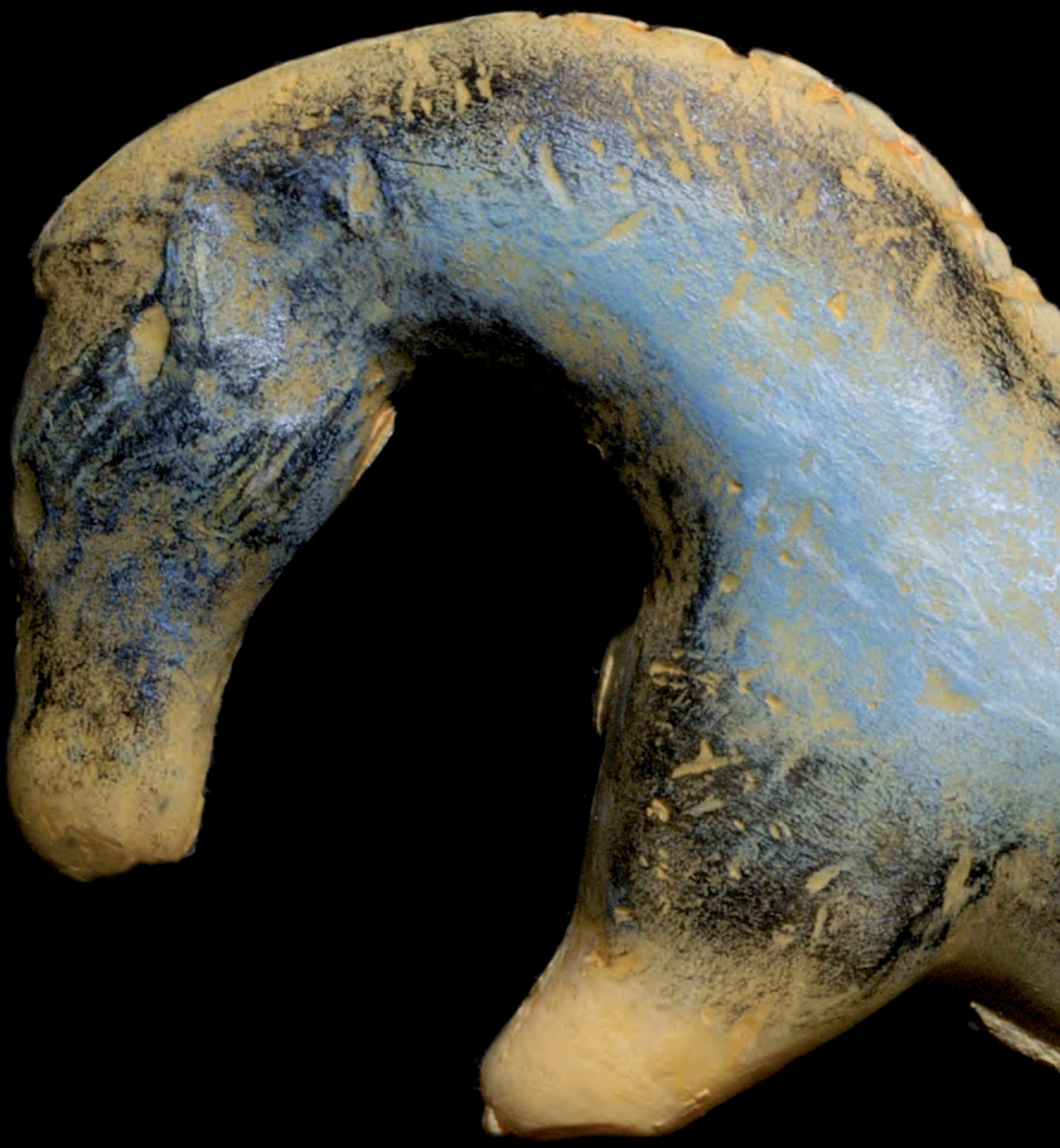
The Vogelherd Horse from Germany (western Europe), 34,000 to 30,000 years old, carved from mammoth ivory.



How to Build a Human

In Seven Evolutionary Steps

Pamela S. Turner • *Art by* John Gurche

Charlesbridge

For Shepherd—P. S. T.

Dedicated to my daughter Blythe, who has surpassed me in all things artistic—J. G.

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Contents

Foreword

Dr. Habiba Chirchir, paleoanthropologist in the Department of Biological Sciences at Marshall University and research associate in Human Origins Program Team, Smithsonian Institution

Dr. Habiba Chirchir.

I read Pamela Turner's *How to Build a Human* from the perspective of a researcher, teacher, and life-long student of human evolution. From this vantage, I appreciated how Pam portrays key human evolutionary concepts in an easily accessible style. She describes the discoveries of paleo-anthropologists across the world, who locate and study a wide range of evidence in their journey to understand human prehistory. She tells the human story in a personable fashion, accompanying the evidence with vivid descriptions that allow readers to envision ourselves in the story of our ancestors' challenges, resilience, and creativity. She also offers a cultural context for human evolution, exploring the complex symbolic behavior of our ancestors, who, like us, made tools, jewelry, and art.

Evolutionary theory is a scientifically and globally accepted theory supported by years of rigorous research and data accumulation. Human evolution falls within the purview of this broader theory. The evidence supporting human evolutionary theory has been amassed through international collaboration among researchers around the world, all applying rigorous and repeated testing of hypotheses, as this book points out. Paleoanthropologists, like any other scientists, may challenge and disagree with specific hypotheses, but there is consensus among them that the first modern humans evolved in the African continent. Some migrated on to populate Eurasia, Australia, and the Americas, while others remained in the African continent. Pam's book illustrates these ideas unequivocally.

How to Build a Human also speaks to our current public dialogue surrounding the issue of human variation, or so-called race. If all humans are of one species, then why do we observe so much variation within that species? Pam answers this question by presenting the most up-to-date scientific evidence of the geographical and environmental factors that played a role in shaping observed human variation. She does not shy away from chronicling how that variation has been co-opted in ways that have been harmful to those considered "other." Her book helps the reader understand how paleoanthropologists from different cultures and backgrounds continue to work together to reconstruct an inclusive story of humanity and to dismantle the notions of "otherness" that were used to justify colonialism and slavery in the past.

I also read the book as a Kenyan who was reared in the Great Rift Valley, where much of the fossil evidence presented in the book was recovered. The text's vivid descriptions remind me of my home as well as my time in the field working as an academic uncovering fossil remains of our ancestors. As I reminisce about the ground of my youth and the land of our forebears, I also gain a broader and longer perspective of my infinitesimally small place in the long history of humanity. This allows me to consider myself both as a Kenyan and East African living in the United States and as part of a much larger global society that was and remains highly interconnected. I hope that reading this book will remind us all that we are cosmopolitan citizens of the world.

Introduction

Imagine that 3 million years ago, an intelligent life-form visits our planet, seeking the brainiest species on Earth for their intergalactic zoo. They would choose a human ancestor, right?

Wrong. Those alien explorers would zoom off with a dolphin.

If those fictional extraterrestrials returned today, they might be stunned to discover that an animal once second-class in the smarts department had evolved into a species that builds cities, makes war, and transmits thoughts from one brain to another brain using little black marks on paper.

Maybe the returning aliens would say: "What a difference a few million years makes!" [1]

How to Build a Human is the story of how we came to be. It's the tale of our extended family, our direct ancestors as well as our cousins. Our ancestors and cousins weren't exactly like us. Most of them couldn't speak. Their most important possessions were broken rocks. But like us they enjoyed the warmth of the morning sun on their cheeks, the taste of honey on their tongue, and the reassurance of a friend's hug. Like us they feared poisonous snakes and creatures with big teeth lunging out of the darkness. Like us they had to deal with whatever life threw at them.

We humans—*Homo sapiens*—are just one of the millions of species that have evolved on this planet during the last 3.6 billion years. Each

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1 Or "Can you *believe* how they trashed the place?"

creature has taken its own winding evolutionary path. The ancestors of dolphins and whales were land animals that entered the sea; ants and bees took social living to extraordinary extremes; and some parasites evolved the ability to hijack other animals' brains.[2]

Yet out of all these evolutionary stories, ours is possibly the weirdest.

2 Such as a one-celled creature that makes rats want to cozy up to cats and a parasitic worm that turns snails into "disco zombies." I am not making this stuff up.

An ancient African ape that lived 20 to 17 million years ago. Like modern great apes such as chimpanzees and gorillas, this ancient ape probably had a dark face and dark fur with pinkish-white skin underneath. Skulls of other ancient and modern primates are shown at the top.

How We Started

Go to a zoo and watch the chimps, bonobos, gorillas, and orangutans. Eventually you'll see something—perhaps a mother comforting a wailing infant—that makes you think: "Oh, look at that! They're so *human*!"

Well, yes, any human would think so. That's because we're so *ape*.

Life on Earth probably began with self-copying molecules. Some of those self-copying molecules eventually became single-celled blobs, some of which eventually became multi-cellular blobs, some of which eventually became weird gooey sea creatures, some of which eventually became fish. Some of those fish shimmied out of the sea, eventually becoming land-dwelling lizard-like creatures. Some of those lizard-like creatures branched off to become the dinosaurs, while others became the first mammals, little creatures about as glamorous as rats.

After the demise of the dinosaurs 66 million years ago,[1] we mammals were among the leftovers. We had room to spread out. Our part of the mammal family tree became the primates (monkeys, apes, lemurs, lorises, and tarsiers). We primates evolved in a rain-forest environment. Forward-facing eyes gave us good depth perception, so we could snap up flying insects. Color vision allowed us to spy ripe fruit amid the forest greenery. Our nimble hands with nails (rather than claws) let us peel fruit and pick open seedpods. Those same grasping hands, along with our rotating shoulder joints, were useful for catching swaying branches as we scampered through the trees.

1 Mammals owe the giant meteor that extinguished the dinosaurs a thank-you card.

Just as our bodies are rooted in our primate past, so are our minds. Primates are social animals: we play, fight, cuddle, and groom each other. We learn from each other, compete with each other, and cooperate with each other. We crave companionship. Isolation from others is a punishment.

What drove this long, slow slog from self-copying molecules to blobs of cells to gooey sea beasties to the first primates to us? What process built humans and every other kind of creature on Earth?

A Short (I Promise) Side Trip into Evolution

Species evolve—that is, change over time—through the process of natural selection. Natural selection acts on biological traits that are passed from one generation to another through genes. Genes, which are made of chains of molecules known as DNA, are a chemical instruction manual for how to build an organism.

Every time two parents have offspring, their genes are copied and reshuffled and a new variation is produced. Unless you have an identical twin, you and your siblings will have different combinations of genes. Maybe you have your mother's nose and your father's eyes, but your sister and brother have a different assortment of family features. It's the same with other species. Every robin in a nest, every wolf pup in a litter, and every baby spider in an egg sac will have slightly different traits than its siblings.

Besides the variations produced when genes are reshuffled, there are also variations caused by small DNA copying errors. These are called mutations. Every single one of us has around thirty to fifty copying errors in our genome (our collection of genes). Most of these mutations make absolutely no difference. But some do. Varying traits—whether produced by mutations or gene reshuffling—are the raw material of evolution.

As each baby robin, wolf pup, and infant spider lives and grows, it is tested by its environment. Is the robin alert enough to avoid the hawk? Is the wolf fast enough to catch a deer? Does the spider produce a web of sufficient stickiness? If the robin, wolf, or spider has helpful genetic traits (quick reflexes, strong muscles, stomach glands that produce webs of the right gluey-ness), then the animal will be more likely to survive and leave behind offspring of its own. Those helpful traits will spread through the robin population, wolf population, or spider population. Traits likely to result in an early death will not be passed on.

If you remember only one thing about evolution, remember this: *the environment tests and the environment selects.*

Imagine a group of gorillas living in the cool, wet, high-altitude forests of east-central Africa. The male has particularly dense hair for

A group of mountain gorillas.

keeping warm. One of the females in his group has thinner hair but an extra-strong immune system for fighting off disease. Of their four offspring, one has thick hair and a so-so immune system, one has thin hair and a so-so immune system, one has thick hair and an extra-strong immune system, and one has thin hair and an extra-strong immune system. You can probably guess which of these four is most likely to survive and pass its helpful traits to the next generation. You can also probably guess which one is most likely to die young. When this selection process happens generation after generation, the result will be a population of gorillas with thick hair and the ability to fend off many diseases.

But not necessarily *all* diseases. Just as gorillas are constantly undergoing natural selection, so are populations of viruses, bacteria, and parasites. The ones best able to overcome the defenses of their host will pass on those traits to their descendants. The life cycles of many disease-causing organisms are often very short, which allows them to evolve new traits very quickly. That's why multiple variants of the COVID-19 virus appeared as the disease spread around the world.

Evolution through natural selection is sometimes called "survival of the fittest." This makes it sound as if being the biggest and brawniest is always better. Not so. In evolution, "fitness" is measured only by the number of surviving offspring. "Fitness" sometimes means being bigger and stronger. But it can also mean being better at digesting a certain type of food or behaving in a certain kind of way. If one elephant is a devoted mother and leaves behind four offspring that also become parents, her genes will have a bigger impact on the next generation than those of an indifferent mother that raises only one calf.

Countless, ever-changing environments have been testing and selecting creatures over the course of billions of years. Some creatures, such as bacteria, don't appear to have changed very much. But don't let looks fool you. Modern bacteria have been evolving for billions of years. As a result they're extremely good at surviving in their mini-environments (like your stomach).

Testing and selecting over long periods of time sent other creatures down different evolutionary paths, and their descendants branched off to follow yet other pathways. Some lines of descent went extinct; others continued to change. The result of the process of evolution is the incredible diversity of life on planet Earth. Including us—*Homo sapiens*.

So here we are on the great tree of life on Earth. We're swinging on the primate branch, clustered alongside our fellow great apes: chimps, bonobos, gorillas, and orangutans. Yet we look and act very different from our hairy cousins. Why?

Our first big step toward becoming human was exactly that: a step.

A male Australopithecus afarensis *(left) and a male* Australopithecus africanus *(right). Both kinds of Australopiths could walk upright yet were still decent tree climbers.*

Step 1
We Stand Up

Look around. Out of over 6,000 mammal species, how many regularly walk (rather than hop) on two legs?

Answer: just us. Giraffes with their goofy necks and elephants with their absurd noses have nothing on humans. We are truly strange.

Around 8 million years ago, our remote ancestors were apes living in a vast rain forest stretching across Africa. The continent's crust slowly cracked. As the pieces pulled apart, the land in between sank, creating the East African Rift System, a series of steep-edged rift valleys along the eastern side of the continent. As the landscape shifted, so did rainfall patterns. What had once been a seamless jungle became a patchwork of woodland, scrub, and grassland threaded by rivers and dappled with lakes and marshes.

Sometime around 7 to 6 million years ago, the forest apes split into two groups. To the west, where the rain forest remained, the forest apes went on living much as they had before. Some of those apes eventually evolved into modern chimpanzees and bonobos. (Chimps and bonobos are our closest relatives in the animal kingdom; we are equally closely related to both, genetically speaking.)

In other parts of Africa, however, where the forest disappeared, the apes could not go on living as they had before. We descend from forest apes that lost their forest.

Modern chimpanzees live mostly in forests. Their clutching feet are an adaptation for tree climbing.

Year after year, millennium after millennium, the environment in Africa's rift valleys tested all the creatures that lived there. Traits that helped a creature survive and reproduce spread through the population. Eventually all these changes added up to a new population that was different enough from its ancestors to be considered a new species.

Former forest antelopes evolved into antelope species with teeth and guts adapted to the tough grasses of the plains and woodlands. Predator populations changed, too. Three kinds of saber-toothed cats evolved: one the size of a leopard, one the size of a lion, and one so big that our ancient ancestor—if inclined—could've walked up on its two legs and looked the giant cat in the eye.[1]

It might seem incredible that former forest apes survived in a more open landscape full of large predators. Many species can't adapt, or can't adapt quickly enough, when their environment changes significantly. They go extinct. But our ancestors had four important things going for them.

ADVANTAGE #1: THEY WERE NOT PICKY EATERS

Like modern chimps, our forest-ape ancestor probably ate fruits, nuts, leaves, insects, honey, and occasionally meat. (Chimp populations have

1 An inclination unlikely to be passed to the next generation, if you know what I mean.

also been evolving over the past 7 to 6 million years, of course. But because chimps live mainly in rain-forest habitats, scientists believe chimps look and act more like our common forest-ape ancestor than we do.)

The varied landscape in Africa's rift valleys offered lots of different foods: fish swimming in shallow pools, roots buried in the sand, nestling birds, dried seedpods. Once in a while our ancient ancestors discovered a big treasure, like a three-toed horse carcass covered in saber-toothed cat spit that had been marinating in the sun for three days.

Did I mention they were not picky eaters?

Advantage #2: They Solved Problems to Get Their Food

Our forest-ape ancestors were "extractive foragers." An extractive forager survives by figuring out how to get food that is nutritious but takes effort to acquire. Our forest-ape ancestors, just like modern chimps, were no doubt adept at peeling fruits, cracking nuts, tearing seedpods, digging out grubs, and smashing open beehives. Extractive foragers also need good memories because many foods are available only in certain places at certain times of the year. *When will the figs be ripe? Where can I find wild cucumbers?* In the varied habitats of the rift valleys, these problem-solving skills were a matter of life and death.

Advantage #3: They Stuck Together

Modern chimps and bonobos usually move around in groups, and our forest-ape ancestors probably did so as well. Being social was especially helpful in open areas with few trees to climb. A predator that might easily pick off a lone ape would be more cautious about approaching a band of thirty.

ADVANTAGE #4: THEY COULD ALREADY STAND ON TWO LEGS

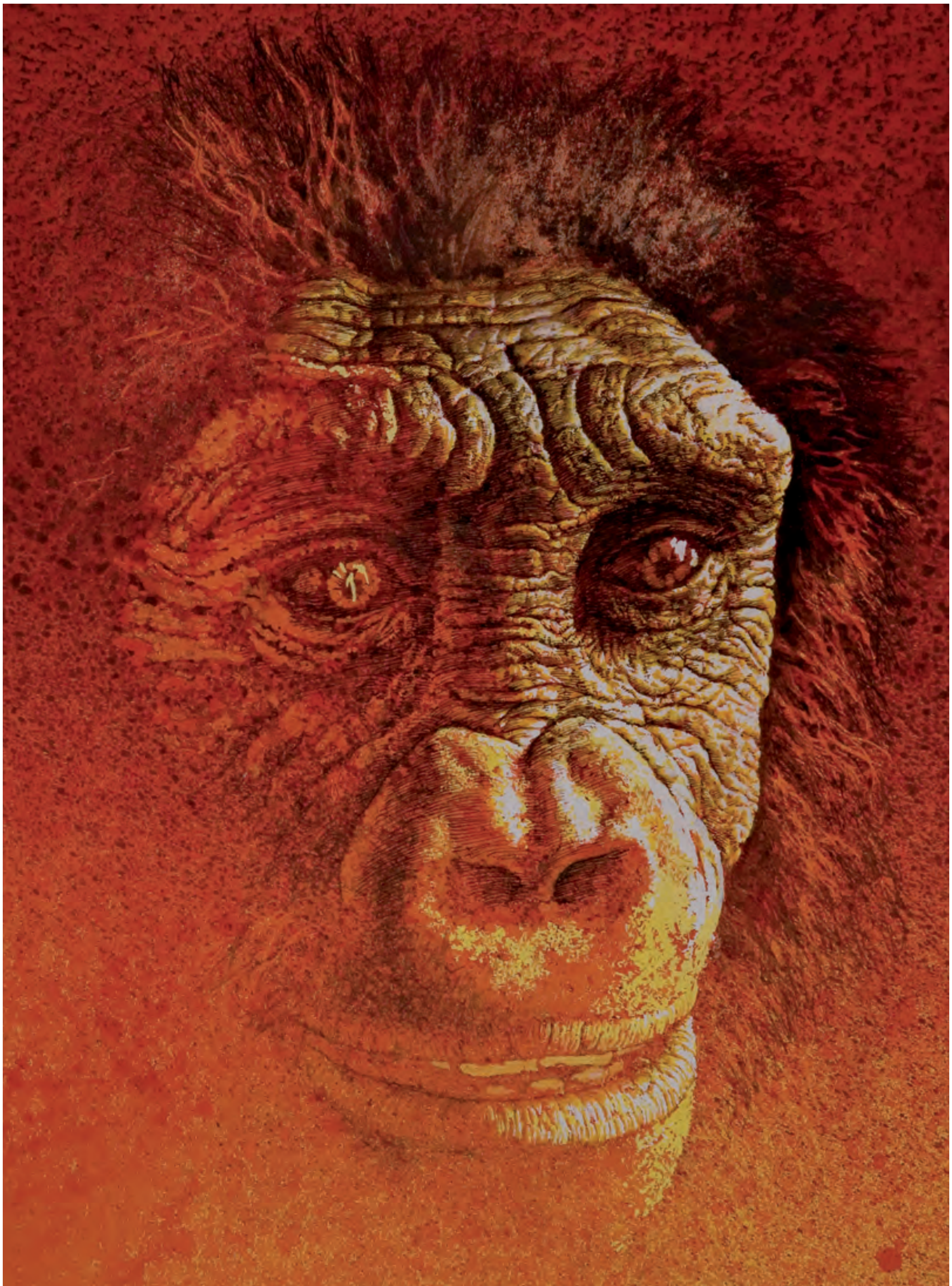
Evolution works upon whatever is at hand. What was at hand 7 million years ago was a problem-solving, group-living forest ape with a broad idea about what was edible and the ability to move in a variety of ways—including on two legs.

It's unclear how far back our upright stance goes. Several kinds of apes that lived about 12 to 10 million years ago might have clambered through trees while standing upright and hanging on to branches with their arms. Modern chimps and bonobos sometimes move this way in the trees, even though they knuckle-walk on the ground. Was our last common ancestor with chimps and bonobos mostly a knuckle-walker or mostly a branch-walker? Or was it equally adept at both? We just don't know.

Moving around on two legs has multiple benefits. Once our forest-ape ancestors found themselves living in open spaces, their ability to stand allowed them to more easily scan their surroundings for food or predators. An upright ape also looks bigger than one on all fours—and looking bigger might help scare off a predator or a rival ape. And standing keeps an ape cooler because less of its body's surface falls under the direct glare of the sun.

Standing was helpful. Two-legged walking was even better. For one thing, it uses less energy than knuckle-walking. Walking also leaves hands free to carry a baby, fling a stick at a snake, or gather berries and seedpods from overhead branches.

If the environment favors the survival of those individuals best at standing and moving around on two legs, then those individuals will leave



Sahelanthropus tchadensis *lived 7 to 6 million years ago and may have been the first ape to regularly move around on two legs.*

behind more offspring. Their advantageous traits—slightly thicker leg bones, slightly flatter feet—will spread through the population. Eventually, after many generations, a new species may evolve.

Scientists have found bits of fossilized bones from three different types of apes that lived from 7 to 5.2 million years ago: *Sahelanthropus tchadensis*, *Orrorin tugenensis*, and *Ardipithecus kadabba*. Sahel, Orrorin, and Kadabba were about the same size as modern chimps. Yet they were not forest apes. All three lived in areas where the rain forest had been replaced by a mixed habitat of woodlands, grasslands, and lakes. Small clues from their bones suggest that they might have moved around on two legs. Not as well as we do now, but definitely better than a modern chimp or bonobo. They could also still climb trees.

Sahel, Orrorin, and Kadabba also had something strange going on with their teeth. Their canine teeth were smaller than expected for apes of their size. Modern great apes use their canine teeth mostly for displays of aggression. This aggressive behavior is more common in males, whose canines are distinctly larger than those of females. The shrinking of Sahel, Orrorin, and Kadabba's mouth-daggers might mean an evolution toward more mellow behavior. This might be related to a need to stick together. After all, if there's safety in numbers, you probably shouldn't sink your teeth into your group-mate. But let's not hand out any Nobel Peace Prizes just yet. The other possibility is that Sahel, Orrorin, and Kadabba didn't need impressive canines to threaten rivals because they could stand upright and use their free hands to hurl stones.

Unfortunately we know very little about Sahel, Orrorin, and Kadabba because so few of their bones have been found. As scientists like to point out, understanding our species' history through fossils is like trying to figure out a complex movie plot based on just a few screenshots.

Sites where **Sahelanthropus tchadensis** *(Sahel),* **Orrorin tugenensis** *(Orrorin),* **Ardipithecus kadabba** *(Kadabba),* **Ardipithecus ramidus** *(Ardi),* **Australopithecus afarensis** *(Lucy's species), and* **Australopithecus africanus** *have been found.*

Around 4.5 million years ago, we get another screenshot: Ardi. Scientists have found the fossilized bones of several dozen individuals of Ardi's species (*Ardipithecus ramidus*). Ardi was small—around 120 centimeters (4 feet) tall. It lived in a mixed habitat of woodlands and forest patches and possibly added tubers (edible roots) to a chimp-like diet of fruit, nuts, seeds, grubs, and honey. Ardi's long arm bones; long, curved finger bones;

and grasping big toe suggest that some part of Ardi's life was spent grabbing and swinging from branches. Yet Ardi did not have the same sort of wrist and hand as modern knuckle-walkers like chimps and gorillas. Based on its spine, leg, foot, and pelvis bones, Ardi could also move upright on the ground. Ardi wasn't yet an efficient walker or runner, though. Efficient walking requires angled thigh bones, a flexible foot, and a broad pelvis. Ardi was only partway there.

Remember: natural selection works upon whatever is around. A trait doesn't have to be perfect or optimal to be passed on. It just has to be a little bit better than what came before. If evolution had a motto, it would be *Yeah. Good Enough.*

Ardi's body wasn't yet optimal for upright walking.[2] But 4.5 million years ago, Ardi was good enough.

About a hundred thousand years after Ardi, the Australopiths arrived on the scene. They were possibly Ardi's descendants. The evolution of the Australopiths is a *"TA-DA!"* moment in human evolution. Scientists aren't sure if we're descended from Sahel, Orrorin, Kadabba, or Ardi. Our direct ancestors could have been another yet-undiscovered species. With the Australopiths it's a different story. There were at least six different species of Australopith, and they were around for about 2 million years. Their fossilized remains have been found in eastern, north-central, and southern Africa. One of these Australopith species is probably our direct ancestor (going back about 300,000 generations).

Modern Africa, with its wonderful diversity of animals, pales in comparison to the lost world of the Australopiths. They lived among saber-toothed cats, lions, leopards, and long-legged hunting hyenas. There were pigs the size of buffalos, three-hundred-pound baboons,

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2 Don't get smug—our bodies aren't optimal, either. That's why so many people have back problems.

short-necked giraffes crowned with moose-like antlers, and short-trunked elephants that looked as if someone had pulled out their tusks and stuck them back in upside down.

Australopithecus afarensis lived about 3.7 to 3 million years ago. One particular find, a 3.2-million-year-old fossil from the northern edge of East Africa's rift valleys, rocked the scientific world when it was discovered. Most scientists would be overjoyed to find a handful of bones from such an ancient creature. This skeleton, nicknamed "Lucy," was 40 percent complete.

Like Ardi, Lucy was only three to four feet tall. Judging by her long arms and curved finger bones, she was still a good tree climber. Her kind probably foraged in trees and retreated into trees at night for safety. The fear of being attacked by a predator—of something lunging from the darkness—is still with us. It's the same terror that underlies horror movies.

A family of Australopithecus afarensis *(Lucy's species).*

Based on the differences in their feet, ankles, knees, and hips, Lucy was a better upright walker than Ardi. Ardi had a chimp-like foot with a grasping big toe, but Lucy's toes faced forward like ours. And Lucy's thigh bones, like those of modern humans, angled inward toward her knee. Angled thighs allow for more efficient walking. When each leg is closer to the center of our body, we can easily place all our weight on one leg at a time. Forest apes like chimps can't do this because their thigh bones aren't angled inward. To walk upright they must waddle awkwardly, shifting their weight from side to side. Australopiths like Lucy didn't walk like chimps; they walked in a near-human way.

Remarkably, we have footprints to prove it. About 3.7 million years ago, a volcano in Tanzania (East Africa) spewed ash across a valley. Three two-legged apes of different sizes walked through rain-soaked ash that later hardened into rock. Maybe the walkers were of Lucy's kind, or perhaps they were a different species of Australopith. But whoever walked through that ancient muck had a stride similar to ours. Their footprints, like human footprints, are close together along the line of travel, and parts of the sole of the foot sink deeper than other parts as the foot presses down and pushes off again. One walker's prints sank in slightly

3.7-million-year-old footprints from Laetoli, Tanzania (East Africa).

deeper on one side than the other, as if it were carrying extra weight on one hip. Could the walker have been toting a baby?

So the Australopiths walked upright. What was going on inside their heads?

Around 3.5 million years had passed since some knuckle-walking forest apes evolved into upright-walking apes of the woodlands, wetlands, and grasslands. Their bones, muscles, and ligaments had changed; they could walk farther with less effort in their search for food. But their brains were still about the same size. Based on skull volume, the brain of an Australopith was approximately 450 cubic centimeters (cc)—about the size of a modern chimp's. A modern human's brain is around three times larger (1,350 cc). At this point, based on brain-to-body ratios, ancient dolphins would have outranked our ancestors in the smarts department.

The Australopiths didn't have anything close to human language. Based on evidence from their skeletons, they didn't have the right kind of throats for making tiny variations in sound as they exhaled. Australopiths probably communicated as chimps do: with hoots, grunts, screams, and simple gestures. They surely used chimp-like alarm calls because there were plenty of predators to be alarmed about. As if giant hyenas and big saber-toothed cats weren't terrifying enough, the Australopiths also had to keep an eye on the sky. Judging by the talon marks gouged into the fossilized skull of a young Australopith known as the "Taung Child," it is clear that an African eagle had seized it by the head.

These ever-present dangers would've encouraged Australopiths to stick together. As social animals, they knew who belonged to their group and who was a stranger. We can imagine they recognized close kin—their mothers and maternal siblings. Chimps and bonobos don't form long-term bonds with their mating partners; it's likely Australopiths didn't, either.

The Makapansgat Pebble. Turn the book upside down and you'll see a slightly different face.

When two neighboring bands of Australopiths met, they may have interacted peacefully—or not so peacefully, depending on the circumstances. After all, if you recognize that certain individuals belong to your "in-group," that means other individuals must be the "out-group." Outsiders may not be welcome at your fig tree or your warthog carcass.

Did Australopiths feel affection for their band members? Did they share food or help the sick or injured? Did they wonder or imagine? We can't know for sure. The Australopiths weren't us. They were more like two-legged chimpanzees.

And yet . . .

A cluster of *Australopithecus africanus* fossils was found in Makapansgat Valley in South Africa. In the same layer as the bones, scientists discovered a lustrous red-brown rock now known as the Makapansgat Pebble. The pebble fits nicely into the palm of a hand. It's a completely natural object shaped by erosion and shows no marks of having been used as a tool. The closest source for this type of stone (jasperite) is several kilometers away. An Australopith must have noticed the pebble, picked it up, and carried it to where scientists uncovered it 3 million years later. Did that Australopith see what we see?

The Australopiths were not human. Yet this pebble whispers of what they might become.

A JUNIOR LIBRARY GUILD SELECTION

★ "A probing look into what fossil evidence and other scientific discoveries tell us about our hominid predecessors . . . Using a disarming narrative nonfiction style, the text clearly explains the significance of each anatomical or behavioral change and paints a fascinating picture of life on Earth during geological eras when big predators like Genyornis newtoni, the "Demon Ducks of Doom," roamed the planet. Turner also presents scientifically grounded theories for why other ancient species of hominids died out. Gurche fleshes out the fossil record with uncommonly lifelike sketches and paintings of hominid faces and full-body figures in discreet poses. Also dispersed throughout the book are thought-provoking color photos of ancient human artifacts. Of particular note is a goose bumps–inducing gallery of prehistoric handprints on cave walls around the world, an image that powerfully brings vanished species into the human fold. The copious backmatter includes a dense, scholarly bibliography; notes on the "myth" of racial, or even species "purity"; and a brief run-through of forces other than natural selection that drive evolution.

GLINTS OF FUN LIGHT UP A ROCK-SOLID DIG INTO OUR STONE AGE ANCESTRY."

—*KIRKUS REVIEWS*, STARRED REVIEW

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